UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N E.
ATLANTA, GEORGIA 30365

4WS-SSRB

MEMORANDUM

SUBJECT: Brown Wood Preserving NPL site
Five-Year Review

FROM: Douglas F. Mundrick, Chief
South Superfund Remedial Branch

THRU: Richard D. Green, Associate Director
Office of Superfund and Emergency Response

TO: Joseph R. Franzmathes, Director
Waste Management Division

Attached please find a copy of the Five-Year Review Report for the Brown Wood Preserving NPL Site in Live Oak, Florida. Section 121(c) of the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA), as amended, requires that if a remedial action is taken that results in any hazardous substances, pollutants, or contaminants remaining at the site, the Environmental Protection Agency (EPA) shall review the remedial action no less often than each five years after initiation of the remedial action to assure that human health and the environment are being protected by the remedial action being implemented. Since the cleanup levels in the Record of Decision (ROD) for the Brown Wood Preserving NPL Site allow for unlimited and unrestricted exposure, a statutory five-year review is not required. However, EPA is conducting this review as a matter of policy to assure that the remedy remains protective of human health and the environment.

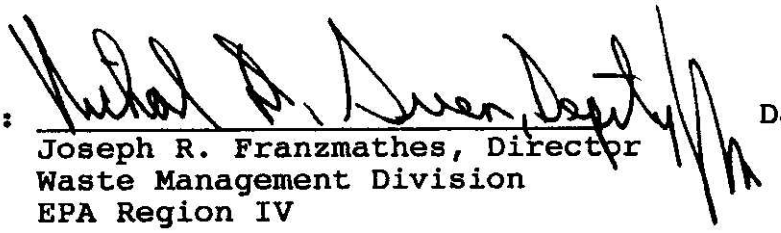
Both soil and ground water contamination are addressed at the Brown Wood Preserving NPL Site. The selected remedy for the soil component included biodegradation of contaminated soil and sludge in an on-site land treatment area (LTA). Completion of the soil remediation was confirmed in July 1990, when a sampling event showed that the soil clean-up and performance goal stipulated by the ROD and Consent Decree criterion had been met.

The selected remedy also provided for ground water monitoring for a minimum of five years following construction of the soil LTA. No detectable levels of pentachlorophenol or PAH indicator compounds have been found in the ground water at the

site, or private supply wells located within a mile of the site, with the exception of samples collected from two monitoring wells. EPA and the Florida Department of Environmental Protection have determined that since no health-based criteria are exceeded and contamination exceeding organoleptic guidance levels is limited, further remediation is not feasible.

Based on the ongoing actions at the site and the interviews conducted during the Five-Year Review, the remedial action meets the requirements of the ROD. The attached Five-Year Review Final Report documents the current conditions at the site and states that the remedial action is complete and continues to be protective of human health and the environment. The report has been peer reviewed by Region IV and Headquarters staff. Another Five-Year Review will not be necessary since the remedy is protective of human health and the environment.

Attachment

Approved by:  **Date:** 30 MAR 95

Joseph R. Franzmathes, Director
Waste Management Division
EPA Region IV

FIVE-YEAR REVIEW

BROWN WOOD PRESERVING SITE

LIVE OAK, SUWANEE COUNTY, FLORIDA

PREPARED BY

U. S. ENVIRONMENTAL PROTECTION AGENCY

REGION IV

ATLANTA, GEORGIA

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LIST OF ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
EPA	Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
LTA	Land Treatment Area
NCP	National Contingency Plan
NPL	National Priorities List
OSWER	Office of Solid Waste and Emergency Response
O&M	Operation and Maintenance
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
TCIC	Total Carcinogenic Indicator Chemicals

1. BACKGROUND

1.1 Introduction

This report documents the policy five-year review conducted in August 1994 for the Brown Wood Preserving National Priorities List (NPL) site, located in Live Oak, Suwannee County, Florida. This five-year review is intended to evaluate whether the response actions taken at the site remain protective of public health and the environment.

The U.S. Environmental Protection Agency's (EPA's) Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-02, provides that a five-year "Statutory Review" is to be conducted for a response action at any site at which a post-SARA remedy, upon attainment of the Record Of Decision (ROD) cleanup levels, will not allow unlimited use and unrestricted exposure. Statutory five-year reviews are required no less often than each five years after the initiation of the remedial action.

Since the cleanup levels in the ROD for the Brown Wood Preserving Site allow for unlimited and unrestricted exposure, a statutory five-year review is not required. However, EPA is conducting this review to assure that the remedy remains protective of human health and the environment.

1.2 Site Location and Description

The Brown Wood Preserving Site (Site) is located at the intersection of Sawmill Road and Goldkist Road, approximately two (2) miles west of the City of Live Oak, Suwannee County, Florida. The Site is situated in the northwest quarter of Section 22, Township 2 South, Range 13 East. The approximately 51-acre Site is located in karst terrain in which sinkholes are a common geological feature. The Site is not located in a floodplain; the topography onsite varies in elevation from 85 feet above mean sea level (AMSL) to 111 feet AMSL. The area surrounding the Site is considered rural and light agricultural. A sawmill and a construction company are located to the west and east, respectively, of the Site. The county airport is located fairly close to the western part of the site. There are four private wells located in the vicinity of the site, the nearest one being approximately 1000 feet to the south. The public water supply wells for the City of Live Oak are located upgradient approximately two miles away. Domestic water in the vicinity of the Site is produced by means of wells into the Floridan Aquifer.

Currently, the site consists of a land treatment area enclosed by a six toot high chain length fence topped with barbed wire and the lagoon area to the southwest (Figure 1). The land treatment area consists of an office, a four-acre clay lined and bermed treatment area which has been seeded with native grasses, and a 750,000 gallon capacity retention pond.

The Site is underlain by karst terrain consisting of limestone and dolomite. This bedrock is reported to be over 2,500 feet thick with more permeable zones situated within the upper 400 feet. The Suwannee Limestone lies from approximately 20 to 100 feet below the land surface of the Site and is the uppermost unit of the Floridan Aquifer. Portions of the Floridan Aquifer are honey-combed with dissolution cavities and interconnected solution pores that allow for the rapid movement of ground water.

1.3 Site History

1.3.1 Site Ownership

From 1948 to 1978, a plant at the Brown Wood Preserving Site pressure treated lumber products with creosote and some pentachlorophenol. Throughout its operation, the facility was owned and run by various companies and operators. Portions of the Site have been and continue to be under different ownership.

The facility was constructed in 1948 by W.F. Bancker & Son and operated until March 1, 1952 as Suwannee Wood Preserving, Inc. The facility was sold to the Brown Wood Preserving Co., Inc. which operated the plant until 1965, when the company was merged into W.P. Brown & Sons Lumber Co., Inc., which operated the plant until 1971. In August 1971, the lumber company was dissolved and the assets taken over by the James Graham Brown Foundation, Inc. which operated the plant until the facility was closed due to a fire on February 7, 1973.

The property was purchased on April 2, 1974 by Mr. W. F. Belote who rebuilt the plant and ran a small number of charges through one cylinder. On December 24, 1976, AMAX Forest Products, Inc. purchased the plant and operated it intermittently until June 22, 1978 when it was bought by Live Oak Timber Treaters, Inc. who may have operated the facility for a short time thereafter. The facility was later owned by Mr. J. Paul Crews.

Present property ownership in the Site area consists of Velma Bird et al (approximately 11 acres), Little Farms, Inc. (24.45

acres), Seaboard Systems (CSX) Railroad (Right of Way - 6.97 acres), and the Suwannee County (8.58 acres). The County recently received ownership of a parcel of property formerly owned by the Koppers Company.

1.3.2 Past Site Operations

The plant consisted of two horizontal retorts (cylinders), a series of storage tanks, a boiler and associated storage yards, and a wastewater lagoon. Creosote was stored in two 50,000 gallon storage tanks immediately east of the retorts. Located further east was a 50,000 gallon tank used for storage of PCP. North of the PCP tank was a mixing tank and a 100,000 gallon tank used for petroleum storage. PCP was received at the Site in solid form, mixed with petroleum in the mixing tank and then stored in the PCP storage tank. Between the petroleum storage tank and the PCP storage tank was a water storage tank. Process water was obtained from an onsite facility well located northwest of the water storage tank. North of the creosote storage tank was a concrete slab on which pumps were located. At the south end of the retorts was an oil/water separator and an evaporator. Steam was used to heat the creosote and was generated in the boiler which was located on the east side of the petroleum storage tank. The boiler was fueled by wood chips and fuel oil.

Untreated timbers were received by rail and possibly by truck, then stored in the area north of the plant until treated. The untreated timbers were loaded onto small rail cars and moved into the retorts for treatment. Treated timbers were removed from the retorts and allowed to dry on the tracks immediately north of the retorts. After drying, treated timbers were moved to the timber storage area north of the treatment plant. Timbers were shipped to buyers by rail and truck from the storage area. The majority of products produced at this Site were treated with creosote; however, at some time during the plant operation, PCP was also used.

Plant wastewater was discharged to the oil/water separator and from there to the lagoon via a culvert and drainage ditch. Creosote recovered from the oil/water separator was discharged to the evaporator where it was heated by steam to evaporate any remaining water. The creosote was then returned to the storage tanks, or if unusable, was pumped to an off-specification storage tank north of the plant.

1.3.3 Site Superfund History

Brown Wood Preserving was proposed for the National Priorities List in 1982. Two PRPs, the James Graham Brown Foundation and AMAX Environmental Services, presently the Cyprus AMAX Minerals Company, signed an Administrative Order on Consent (AOC) with EPA in September 1983 to conduct a RI/FS. From December 1987 through March 1988, while the RI/FS was underway, AMAX/Brown conducted a removal of the lagoon sludges during the winter dry season and the dismantled the plant facility. EPA approved of AMAX/Brown's proposed activities and began negotiating a Consent order while the removal proceeded. The Consent Order was completed in January 1988, and the removal activities were completed in March 1988.

The removal activities consisted of the following: removal of approximately 15,000 tons of creosote sediments/sludge; treatment of 200,000 gallons of lagoon water; and the dismantling, decontamination, and disposal of the entire plant facility. The creosote sediments/sludge, which came primarily from the lagoon area, were shipped to the hazardous waste landfill in Emelle, Alabama. The removal cleanup criteria for the contaminated soils was 5,000 mg/kg total creosote substances.

The Final Feasibility Study Report evaluated seven alternatives for the remediation of contaminated soils/sediments at the Site: (a) No Action, (b) On-Site Incineration, (c) Land Treatment, (d) Off-Site Incineration, (e) Off-Site disposal, (f) Sludge Treatment and Land Treatment, and (g) Biological Pretreatment and Land Treatment.

The Record of Decision (ROD), signed on April 18, 1988, determined cleanup at the site was needed and determined the selected remedy, sludge treatment and land treatment, would adequately protect public health, welfare, and the environment. The Remedial Design/Remedial Action (RD/RA) Work Plan for the land treatment area (LTA) was approved September 15, 1988. The Remedial Action construction of the LTA began in October 1988 and the Consent Decree was entered on October 24, 1988. The design of the LTA was prepared according to the ROD and the design was implemented according to the approved RD/RA Work Plan.

The Pre-Final Remedial Action Construction Inspection was held onsite on December 14, 1988. The Final Remedial Action Construction Inspection Meeting was held onsite on January 19, 1989, as required for the approval of the Remedial Action Construction Report and subsequent Certification of Remedial

Action construction completion. The Remedial Action construction was completed according to the approved design in the RD/RA Work Plan. Upon Certification of Remedial Action construction completion in April of 1989, Operation and Maintenance (O&M) activities began and lasted in duration for (5) years, in accordance with the ROD and Site Closeout Report.

The Site Close Out Report was approved by the Regional Administrator of EPA on December 31, 1991. In May 1992, Remediation Technologies, Inc. (RETEC) submitted a Supplemental Risk Assessment for AMAX/Brown to include toxicological information which was not available at the time of the Baseline Risk Assessment. O&M ended with the submittal of the July 1994 Semi Annual Status Report.

1.4 Remedial Objectives

Cleanup Standards were based upon the results of the Risk Assessment which focused upon attaining at least a 1×10^{-6} risk with regard to ingestion of contaminated soil by a child. Cleanup standards were described by means of the total concentration of the six Total Carcinogenic Indicator Chemicals (TCICs). The cleanup standard for the Remedial Action was 100 mg/kg for the TCICs. Cleanup standards were not developed for pentachlorophenal or fluoranthene because the 1987 baseline risk assessment indicated no possible present or future health impacts from either compound. The cleanup standards for the selected remedy were finalized by EPA after discussions with FDER and AMAX/Brown.

The selected remedy was basically Alternative (f) of the Final Feasibility Study Report: Treatment and Disposal of Sludges and Land Treatment of Soils. Major modifications to Alternative (f) included:

a) If the land treatment (biodegradation) did not attain the desired cleanup levels for the appropriate Indicator Chemicals within a two (2) year time period, but quarterly monitoring showed substantial progress towards meeting these cleanup goals, then EPA would consider extending the treatment time period. However, if no progress was substantiated, then alternative means of dealing with the contaminated soils, such as capping, removal, incineration, solidification, or vitrification, would be considered by EPA;

b) Ground water monitoring would begin at the completion of the LTA construction and continue for a minimum of five (5) years;

c) Contaminated soils exceeding 5,000 mg/kg total creosote substances were to be stabilized and removed to an EPA-approved hazardous waste facility; and

d) Contaminated soils exceeding certain lower contaminant levels (between 100 mg/kg TCICs and 5,000 mg/kg total creosote substances) were to be biodegraded in an onsite lined LTA.

The final remedy consisted of three major tasks:

a. Site preparation;

b. Construction of the Treatment System for biodegradation;

c. Operation and Maintenance (O&M).

The site was prepared for RA construction by clearing and grubbing the proposed biodegradation area and installing a drainage swale so that the water would drain in a controlled manner. A barbed wire fence with hazardous material warning signs was constructed around the LTA.

The Remedial Action construction consisted of grading the area for the LTA and creating the drainage system. The LTA is a four-acre clay-lined area which is surrounded by earthen berms. The LTA has a one (1)% slope to the northwest where a subsurface drainage system drains out under the berm into a gravel lined swale that leads down to the retention pond. The clay for the liner came from the borrow pit which was subsequently shaped and clay lined to use as the retention pond for collection of water/leachate from the LTA.

Operation and Maintenance (O&M) of the source control action involved two (2) years of soil degradation monitoring. A six inch lift of contaminated soil, which had been stockpiled onsite, was added to the LTA approximately every three months, until all of the contaminated soil was in the LTA. The TCIC concentration was required to be reduced to 100 mg/kg before the next lift was added. The soils in the LTA were monitored and sampled quarterly to determine effectiveness for the remainder of the two (2) year O&M period for soils. A summary of the O&M sampling activities are described in the appendices. The O&M for the ground water

began after the Certification of Remedial Action construction completion in April 1989, and consisted of semi-annual sampling for a period of five (5) years.

1.5 Operation and Maintenance Results

O&M activities were divided into two categories, soil and groundwater. Monitoring of the soil in the biodegradation area was to last for two (2) years, while onsite groundwater monitoring was to last for five (5) years.

Soil samples were collected on July 24, 1990 to confirm that the concentration of PAHI compounds in the treated soil were below the clean-up criterion. Data from the July soil sampling event confirmed that the soil clean-up performance goal stipulated by the Record of Decision (ROD) and Consent Decree for the Brown Wood Preserving Site criterion had been met. In the LTA, the level of contaminants exists below 10 ug/kg.

No detectable levels of pentachlorophenol or PAH indicator compounds have been detected in the groundwater at the site, or private supply wells located within a mile of the site, with the exceptions of samples collected from monitoring well MW-7 and one sample collected in December 1990 from MW-8 (Figure 1). The only PAH detected in MW-7 was naphthalene, which has been consistently detected in every sampling event. Naphthalene was also the only PAH detected in MW-8 at a concentration of 1.1 ug/L. Historically, naphthalene has been detected in MW-7 at concentrations ranging from 11 to 210 ug/L.

Naphthalene concentrations were lowest during the summer months and highest during the winter months, representing a seasonal trend. Statistical analysis demonstrated that the deseasonalized concentrations are steady.

For the period of June 1989 through December 1991, lower levels of naphthalene (11 to 65 ug/L) were noted than during the period June 1992 through June 1994 (81 to 175 ug/L). It is hypothesized that the groundwater quality data from MW-7 has been influenced by low water table conditions that occurred prior to and during the period of June 1989 through December 1991, and that the low naphthalene concentrations in MW-7 are a result of lower than usual groundwater elevations and/or other factors related to these conditions. Subsequently, when the groundwater elevations increased after the drought period, the naphthalene concentrations increased.

During the most recent sampling, June 1994, a routine groundwater sample was collected from MW-7. The well was then purged for approximately 6 hours and another sample was collected. The primary sample showed a detected level of 85 ug/L, and the second sample showed a detected level of 100 ug/L. It has been shown that the level of naphthalene has stabilized near the concentration of 100 ug/L, and there is no migration to existing downgradient private wells.

1.6 ARARs Review

The applicable or relevant and appropriate requirements (ARARs) are summarized below:

- Drinking Water Standards;
- State Water Quality Standards;
- Ambient Water Quality Criteria for PAHs;
- Florida Groundwater Standards;
- Federal and State Hazardous Waste Regulations.

During a review of these ARARs, EPA did not identify any changes in the standards above which would challenge the protectiveness of the remedy selected.

The naphthalene concentrations in MW-7 are well below the Federal Drinking Water Equivalent Level for naphthalene of 1400 ug/L. The State of Florida in Chapter 17-770.730, F.A.C. established a clean-up standard of 100 ug/L for naphthalene, which is met by the MW-7 concentrations. Furthermore, Florida has a minimum criteria organoleptic guidance concentration for naphthalene of 6.8 ug/L (1994 Florida Ground Water Concentration Guidelines). Minimum criteria are established in Chapter 62-520 (formerly Chapter 17-3), F.A.C. Data indicate that exceedence of this criteria is limited and because of the complex karst geology a distinct contaminant plume does not appear to exist, therefore, design of a groundwater remedy is not practicable.

2. SITE CONDITIONS

2.1 Summary of Site Visit

A Five-Year Review site visit was conducted on Tuesday, August 9, 1994 by EPA Remedial Project Manager Anne Marie Gillespie and FDEP Project Manager Doug Fitton. John Ryan and Marianne Goforth of RETEC, Stanley Hugenberg and Mark Hyland of The James Graham Brown Foundation, and Johnnie Greene of Cyprus AMAX Minerals Co. were also present at the site. The purpose of the site visit was to evaluate and document the site physical characteristics.

The following is a summary of observations made during the site tour with references to photographs which are included as Appendix B of this report. The site tour began at the trailer adjacent to the soil treatment area (Photographs 1 and 2). The treatment area is approximately 4 acres in size and is completely surrounded by an earthen berm which in some places is almost 10 feet high (Photograph 3). The tour continued along the southern portion of the site to the pond which was the location of the 1988 sludge removal (Photograph 4). This area is much lower in elevation than it was before the removal. The drainage system for the LTA routed infiltrating water through a runoff area (Photograph 5), and into a retention pond which was constructed as part of the RA construction. The site tour ended with locating and inspecting the southern most monitoring wells, onsite MW-7 and MW-6 on the Bird property.

2.2 Summary of Interviews

A meeting was held at the offices of FDEP in Tallahassee, Florida on Monday August 8, 1994 with FDEP, EPA and the PRPs to discuss the remaining groundwater issues at the site. Participants at the meeting included Kelsey Helton and Doug Fitton of FDEP, Anne Marie Gillespie of EPA, John Ryan and Marianne Goforth of RETEC, Stanley Hugenberg and Mark Hyland of The Brown Foundation, and Johnnie Greene of AMAX. Kelsey Helton and Doug Fitton expressed their concern about the naphthalene concentrations in MW-7 existing above the 6.8 ug/L organoleptic guidance concentration, and meeting the 100 ug/L standard required in Chapter 62-770.730, F.A.C. (formerly Chapter 17-770.730, F.A.C.).

The subject of future site use was addressed by Stanley Hugenberg of the Brown Foundation stating that the County of Suwannee, who will be the future owners of the site, have agreed to deed restrictions at the request of AMAX/Brown in order to limit their

liability which limit the property use to non-residential uses. FDEP and EPA agreed with RETEC that the naphthalene in MW-7 appears to be only a localized occurrence which is not evident in any of the downgradient wells. It also appears that the naphthalene concentration has stabilized at a level around 100 ug/L. The property which is to be given to the County includes all of the onsite wells, and extends an additional approximate 100 feet south of MW-7. Mr. Hugenberg inquired about future uses of groundwater at the site. EPA agreed that the groundwater upgradient from the LTA could be utilized. FDEP indicated that there were no regulatory mechanisms for preventing private well installation in areas where primary drinking water standards were not in violation.

Kelsey Helton stated that these points would be presented to management with a recommendation for delistment.

A site meeting was held on Tuesday, August 9, 1994 including representatives of Suwannee County. According to a March 1994 agreement between the County, AMAX and the Brown Foundation, restrictive covenants to the uses of the property include: residential use; schools or day care facilities; playgrounds, parks or other recreational uses; access by the general public, except for specified purposes with supervision; and uses involving any subsurface disturbance in areas where waste materials or debris may be buried, except with prior approval of EPA and notice given to the Foundation and AMAX. These restrictions were developed by AMAX/Brown in order to limit contact with the soils in the bermed treatment area. The County discussed the possibility of placing asphalt on that area so that the entire property could be utilized.

The issue of groundwater future use was raised by the County. It was concluded that wells installed in areas upgradient from the LTA would likely meet organoleptic levels and that existing State regulations, Chapters 62-524 and 62-550, F.A.C., would not restrict construction of potable wells. EPA and FDEP Hazardous Waste Cleanup representatives agreed that a recommendation for delistment was appropriate, as no health-based criteria are exceeded at this site, contamination exceeding organoleptic guidance levels is limited, and remediation is not feasible.

2.3 Areas of Noncompliance

All areas at the Brown Wood Preserving Site are in compliance with the soil cleanup levels set forth in the 1988 ROD.

3. RECOMMENDATIONS

3.1 Technology Recommendations

It is recommended that the Brown Wood Preserving Site be deleted from the NPL.

3.2 Statement on Protectiveness

The selected remedy remains protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost effective.

3.3 Next Review

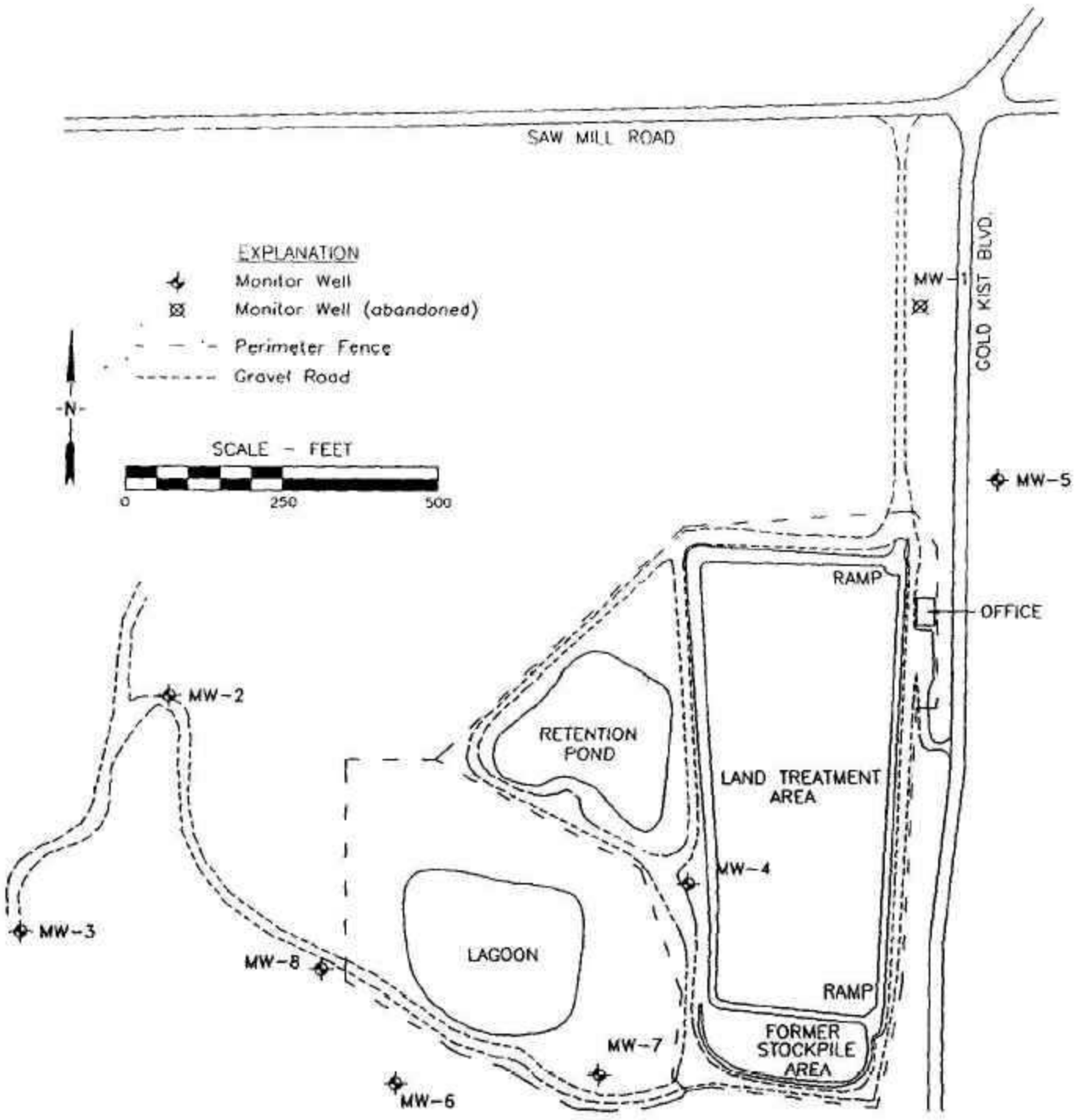
It is anticipated that this site will be deleted from the NPL in 1995. Another five-year review will not be necessary since the remedy is protective of human health and the environment.

3.4 Implementation Requirements

There are no implementation requirements associated with this recommendation.

APPENDIX A

FIGURES



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MONITOR WELL LOCATION MAP
FORMER WOOD TREATING SITE
LIVE OAK, FLORIDA

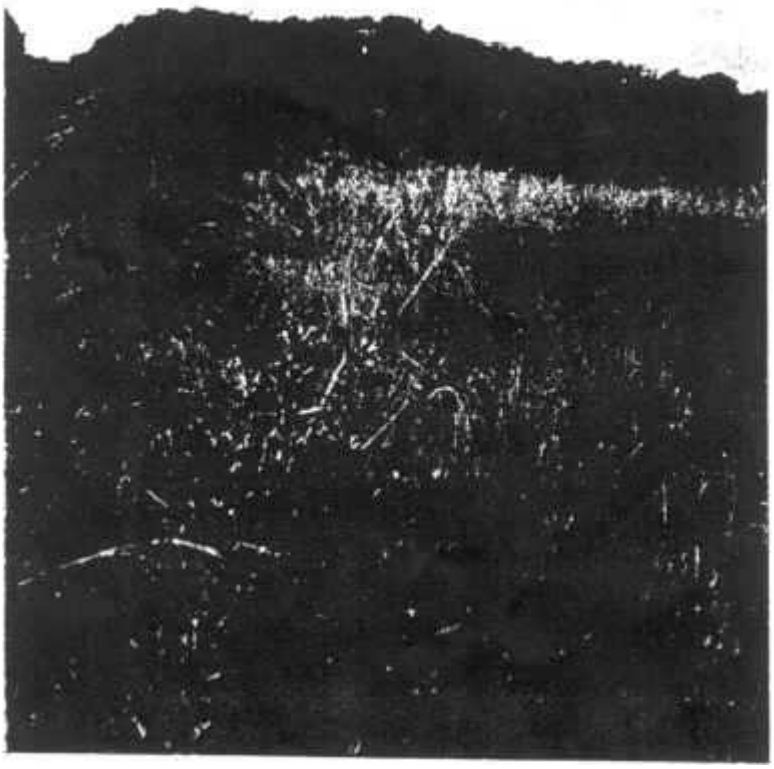
RETEC
REMEDIATION TECHNOLOGIES INC

FIGURE 1

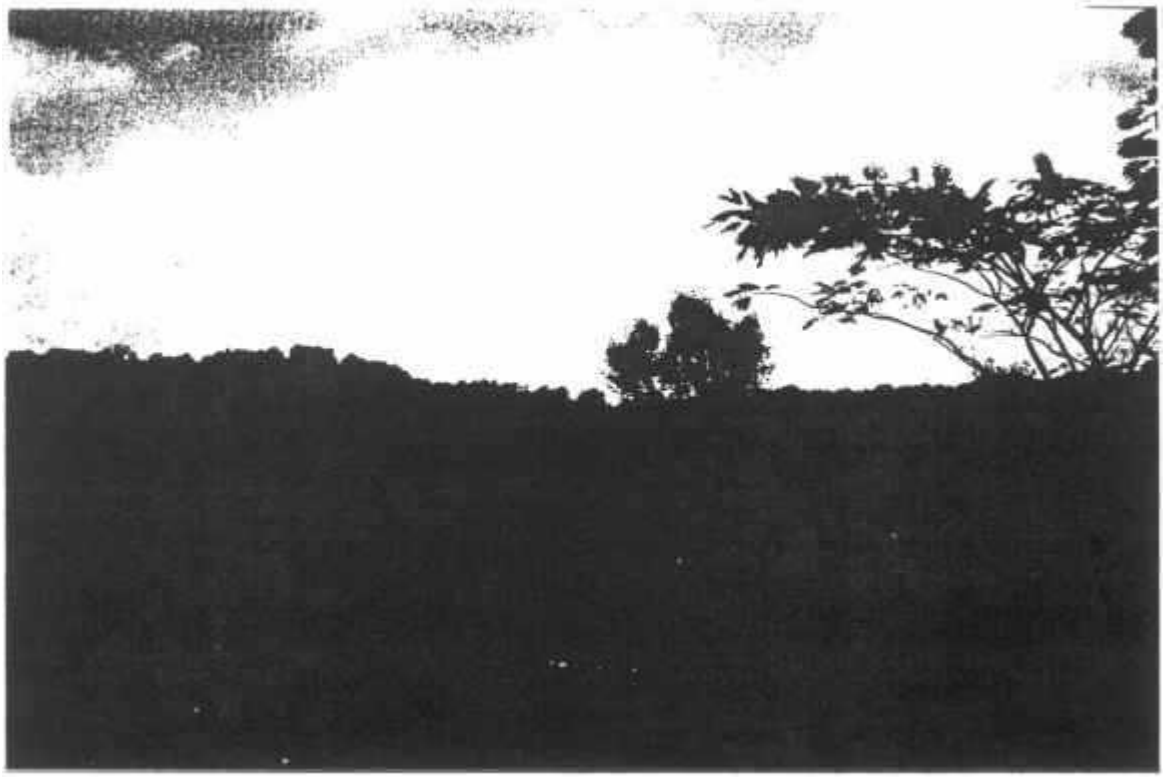
APPENDIX B

PHOTOGRAPHS OF SITE

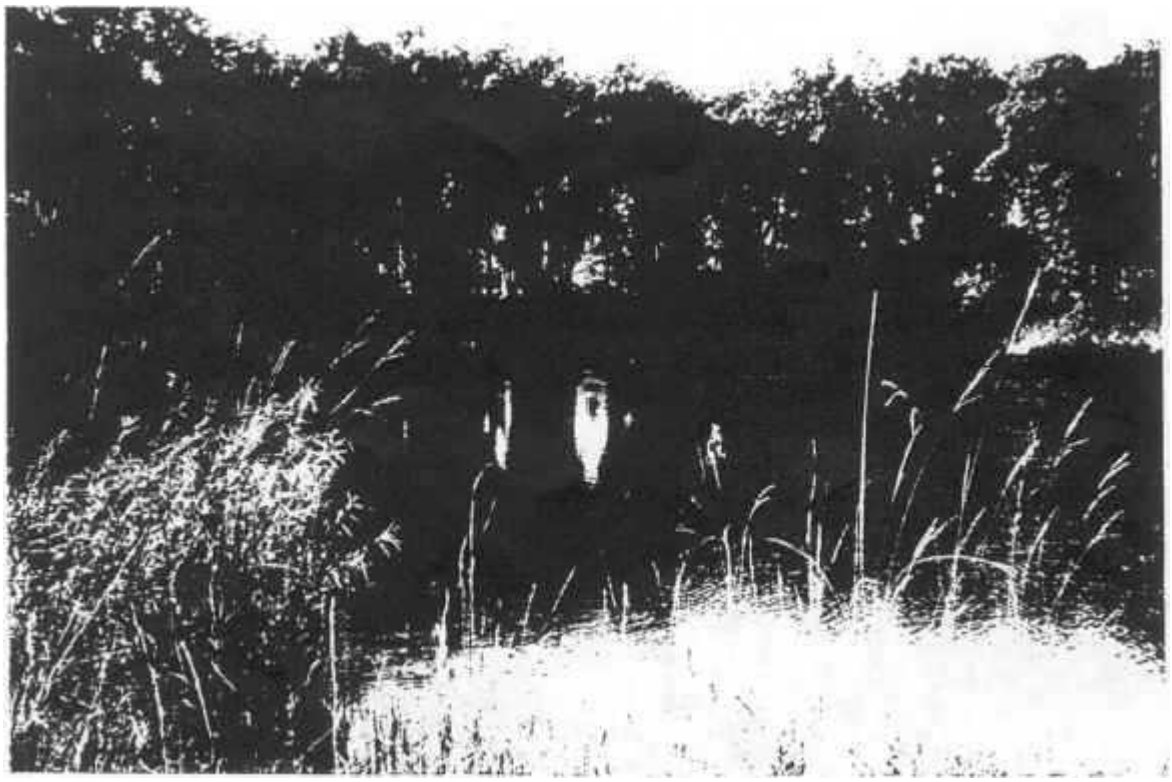
Photograph 1:
Land Treatment Area



Photograph 2:
Land Treatment Area



Photograph 3:
There is an earthen berm surrounding the LTA.



Photograph 4:
The former wastewater lagoon held the majority of contaminated sludges excavated in the 1988 removal.

Photograph 5:
Leguminous trees now grow in the area of the former drainage/ runoff bed for the LTA.

Photograph 6:
This artificial pond was the place where runoff and infiltrating water would come to from LTA.